Improving Semiconductor Transistor Charge Ephemerality Through Cyclical Optically-Driven Active Evacuation of Electrons via Subsumption into Helical Light

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Introduction

Pushing forward the boundaries of what is possible with semiconductor transistors demands further improving the ephemerality of the charge of these transistors i.e. shortening the length of time for which they retain an electrical charge. In order for a new clock cycle to begin, regardless of which novel processor paradigm one might be thinking of (multiple concurrent clock speeds within the same processor, induction-driven partial discharge, etc.) there must be a meaningful discharge of the transistors before a new cycle can be initiated.

Electrons may flow outward from transistors into the ground material (silicon) at approximately 10% of the speed of light, with this boundary constituting a definitive limitation on how quickly a transistor may complete a discharge cycle.

Light, given its ability to move at about 10x this rate, may be used in a novel way in order to support a new processing paradigm.

Abstract

Ordinarily, it would be undesirable to introduce charge carriers such as photons into a material one wishes to rid of electrical charge. Photons tend to convert into electrons, particularly within semiconductors. The newfound ability to structure light helically opens up many exciting new possibilities for optics. While one of these deals with generating scatter-resistant light for communications and missile defense application, another heretofore unexplored application for this type of light lies in computing.

Under ordinary circumstances, electrons, given their mutual interaction with the discrete magnetic fields of surrounding materials, tend to be slowed as if by friction. Typically, electrons will not flow at anywhere near the speed of light, instead tending to flow at around 10% of the speed of light through most conductors. Increasing magnetism tends to further slow this flow rate, but chilling the conductor to absolute zero increases the speed of flow of electrons for the reason that doing so eliminates the discrete magnetism of the electrons involved.

Helical light has a number of properties that make it well-suited to be a facilitator of electron evacuation from transistors so as to re-prime a processors to begin a new computational cycle free of any electrical charge associated with

the previous cycle much more rapidly than would be possible via waiting for charge to dissipate spontaneously.

Helical light has the capacity to penetrate opaque objects up to a certain depth, even in the visible spectrum. It, furthermore, has a self-reinforcing magnetic structure, meaning that it is far less likely to be converted into electricity and far more likely to knock excess electrons within semiconductors out of their orbits and clear of the transistors entirely. If one considers the analogy of a heavy vehicle like a truck colliding with a smaller, lighter vehicle like a sub-compact automobile, objects with greater mass exert more kinetic force and potential energy is transferred, in kinetics, into the lighter-weight object and out of the heavier object. The consequence of this is that the heavier object in a collision experiences virtually no alteration to its vector and objects that are even slightly lighter will frequently suffer catastrophic damage as a result of G-forces.

In the world of the magnetic relationships between electrons, when helical light comes into proximity with excess electrons in a semiconductor, they act like a big-rig truck and sweep up those electrons whilst moving through the area at light speed. Electrons would, at this point, be accelerated and subsumed by the helical light and carried for a short distance (just far enough to remove them from the processor, most likely,) a fact which would consequently open up the possibility of starting a new processor cycle far sooner than would otherwise be possible.

Explaining how this might be possible requires no revision to the Standard Model as something similar is already at play in devices such as electron guns, which use magnetism to accelerate electrons ripped away from hydrogen atoms. The only difference in this case is that the magnetism used to accomplish this is derived from light which passes directly through a processor between cycles and which is structured so as to act with sufficient force so as to "tractor" electrons out of semiconductors at the speed of light, not unlike boxcars inserted into a train for a length of track before being uncoupled at some subsequent point.

Conclusion

We can expect that if successful, this approach would be able to expurgate excess electrons from a microprocessor over a period of slightly over one picosecond, making possible clock speeds approaching 1THz even in conventional processor designs, with a sufficient cooling apparatus. Self-cooling strategic phonon generation-based models would likely thrive in such a design, as would multiple concurrent clock-speed-based designs. The greatest performance would likely be seen in induction-based partial discharge designs, with the only possible complication lying in the potential for the trapped ions used to convey Coulomb forces being potentially ripped from their ion traps by the helical light.

Should this become an issue, ion traps could be improved so as to prevent this, but testing will be required to determine the extent to which this becomes an problematic.

A minimum of a tenfold increase in clock speeds may be realized, importantly, through the cyclic pulsing of this form of structured visible light through virtually any semi-conductor based processor, be it of a conventional or experimental nature. This revelation makes such an approach to improving transistor ephemerality highly deserving of development. Just as light and sound have both been counterintuitively demonstrated to be capable of bringing about the cooling of an object, it makes good sense that under the right conditions, light may, under this particular circumstance, strip semiconductors of their charge rather than adding to it. This being possible, we should be able to begin research into what may be termed *active evacuation* of electrons during transistor discharge.